WHAT IS CLAIMED IS:

1. A method for manufacturing a semiconductor optical waveguide comprising the steps of forming a first semiconductor layer overlying a semiconductor substrate, said first semiconductor layer having an aluminum concentration which increases from a central part, as viewed in the thickness direction of said semiconductor layer, toward both surfaces of said first semiconductor layer, and selectively oxidizing said first semiconductor layer to obtain a non-oxidized region constituting an optical waveguide and an oxidized region surrounding said non-oxidized region.

2. A method for manufacturing a semiconductor optical waveguide as defined in claim 1, further comprising, between said first layer forming step and said selective oxidizing step, the step of forming said first semiconductor layer into a ridge structure.

3. A method for manufacturing a semiconductor optical waveguide as defined in claim 2, wherein said ridge structure is of a taper having a width which

decreases as viewed in a travelling direction of light in said optical waveguide.

4. A method for manufacturing a semiconductor optical waveguide as defined in claim 1, further comprising, after said oxidizing step, the step of bonding a semiconductor optical device to said semiconductor optical waveguide, with an optical axis of said semiconductor optical device being aligned with an optical axis of said optical waveguide.

5. A method for manufacturing a semiconductor optical waveguide as defined in claim 1, further comprising the steps of forming a semiconductor laser by using a metal-organic chemical vapor deposition (MOCVD).

6. A method for manufacturing a semiconductor optical waveguide as defined in claim 1, wherein said first semiconductor layer is formed by using a molecular beam epitaxy (MBE).

7. A method for manufacturing a semiconductor optical waveguide as defined in claim 1, wherein said

first semiconductor layer has a composition of $Al_xGa_{1-x}As$, given x being not higher than 1.

8. A method for manufacturing a semiconductor optical waveguide as defined in claim 7, wherein given x is between about 0.5 and about 0.97 at said central part, and given x is substantially 1 at said both surfaces of said first semiconductor layer.

9. A semiconductor optical device comprising a optical waveguide manufactured by the method as defined in claim 1, wherein said first semiconductor layer contains one or more materials selected from the group consisting of $Al_xIn_{1-x}As$, $Al_xIn_{1-x}P$, $Al_xGa_{1-x}P$, $(Al_xGa_{1-x})_yIn_{1-y}P$, and $(Al_xGa1-x)_yIn_{1-y}As$, given x and y being between 0 and 1.

10. A semiconductor optical device comprising an optical waveguide manufactured by the method as defined in claim 1, wherein said first semiconductor layer is tapered as viewed along an optical axis of said optical waveguide, and said optical waveguide has a substantially circular shape at a distal end thereof.

11. A semiconductor optical device as defined in claim 10, wherein said waveguide has a width not higher than about 0.5 μm at said distal end and a width not lower than about 2.0 μm at a proximal end of said waveguide.

12. A semiconductor optical device comprising an optical waveguide manufactured by the method as defined in claim 1, and an optical element having an active layer coupled with said optical waveguide.

13. A semiconductor optical device as defined in claim 12, wherein said optical element is a semiconductor laser.